IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences

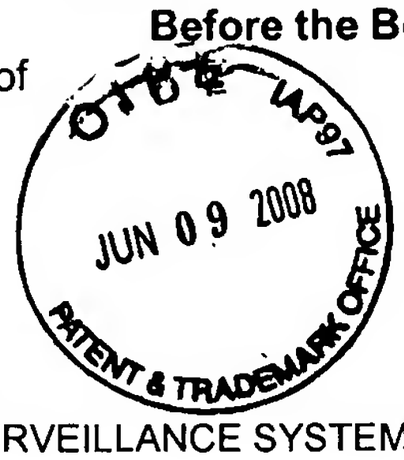
In re Patent Application of

HILL et al.

Serial No. 10/573,671

Filed: March 24, 2006

Title: FIBRE-OPTIC SURVEILLANCE SYSTEM



Atty Dkt. SCS-124-1154
C# M#
Confirmation No. 5058
TC/A.U.: 2874
Examiner: E. Kim
Date: June 9, 2008

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

☐ **Correspondence Address Indication Form Attached.**

☐ **NOTICE OF APPEAL**
Applicant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the Examiner twice/finally rejecting applicant's claim(s). $510.00 (1401)/$255.00 (2401) $

☒ An appeal **BRIEF** is attached in the pending appeal of the above-identified application $510.00 (1402)/$255.00 (2402) $ 510.00

☐ Credit for fees paid in prior appeal without decision on merits -$ ( )

☐ A reply brief is attached. **(no fee)**

☐ Petition is hereby made to extend the current due date so as to cover the filing date of this paper and attachment(s)
One Month Extension $120.00 (1251)/$60.00 (2251)
Two Month Extensions $460.00 (1252)/$230.00 (2252)
Three Month Extensions $1050.00 (1253/$525.00 (2253)
Four Month Extensions $1640.00 (1254/$820.00 (2254) $

☐ "Small entity" statement attached.

Less month extension previously paid on -$( )

TOTAL FEE ENCLOSED $ 510.00

☒ **CREDIT CARD PAYMENT FORM ATTACHED.**

Any future submission requiring an extension of time is hereby stated to include a petition for such time extension. The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our **Account No. 14-1140.** A duplicate copy of this sheet is attached.

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NIXON & VANDERHYE P.C.
By Atty: Stanley C. Spooner, Reg. No. 27,393

Signature: _____

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
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In re Patent Application of	Confirmation No.: 5058
HILL et al.	Atty. Ref.: 124-1154
Serial No. 10/573,671	Group: 2874
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For: FIBRE-OPTIC SURVEILLANCE SYSTEM

* *

APPEAL BRIEF

On Appeal From Group Art Unit 2874

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In re Patent Application of

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APPEAL BRIEF

Sir:

I. REAL PARTY IN INTEREST

The real party in interest in the above-identified appeal is QinetiQ Limited by virtue of an assignment of rights from the inventors to QinetiQ Limited recorded April 20, 2006 at Reel 17838, Frame 738.

II. RELATED APPEALS AND INTERFERENCES

There are believed to be no related appeals, interferences or judicial proceedings with respect to the present application, other than the Pre-Appeal Brief Request for Review previously filed in this appeal on April 3, 2008.

III. STATUS OF CLAIMS

Claims 1-16 stand finally rejected in the outstanding Final Rejection. The Examiner contends that claims 1-5, 8-10, 12, 15 and 16 are anticipated by Appellants' submitted prior art, Yurek (U.S. Patent 5,140,154). The Examiner also alleged in the final rejection that claims 1-7 are anticipated by Goldner (U.S. Publication 2006/0120675) and that claims 11, 13 and 14 would be obvious over Goldner, but in the Advisory Action of May 7, 2008 (Paper No. 20080506-B) the Examiner stated that the "rejections over the Goldner et al patent have been dropped since Applicant's argument regarding these rejections are persuasive." Ass a result, there is no pending rejection of claims 6, 7, 11, 13 and 14 and only claims 1-5, 8-10, 12, 15 and 16 are rejected.

The sole remaining rejection of claims 1-5, 8-10, 12, 15 and 16 are appealed.

IV. STATUS OF AMENDMENTS

No further response has been submitted with respect to the Final Official Action in this application other than the filing of a Pre-Appeal Brief Request for Review which decision was mailed on May 7, 2008 (Paper No. 20080506) although the Advisory Action, also mailed on May 7, 2008 "dropped" all rejections based on the Goldner reference..

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Appellants' specification and figures provide an explanation of the claimed invention set out in independent claim 1 and dependent claims 2 and 15, with each claimed structure and method step addressed as to its location in the specification and in the figures.

1. A fibre-optic sensor array [array 15 as shown in Figure 1 and discussed on page 6, lines 2-5 and elsewhere in the specification] for a surveillance system [perimeter surveillance system 10 as shown in Figure 1 and discussed on page 6, lines 1-5 and elsewhere in the specification], the sensor array comprising:

at least two fibre-optic point sensors [geophones 16A, 16B, . . . 16N as shown in Figure 1 and discussed on page 6, lines 15-20 and elsewhere in the specification]; and

a distributed fibre-optic sensor [distributed sensors 18B, 18C, . . . 18N as shown in Figure 1 and discussed on page 6, lines 11-13 and elsewhere in the specification] linking said at least two fibre-optic point sensors [geophones 16A, 16B, . . . 16N], wherein said sensor array provides an array output of sensed data from said at least two fibre-optic point sensors and said distributed fibre-optic sensor [data link 14 as shown in Figure 1 and discussed on page 6, lines 6-9 and elsewhere in the specification].

2. A fibre-optic surveillance system [perimeter surveillance system 10 as shown in Figure 1 and discussed on page 7, lines 9-18 and elsewhere in the specification] including a fibre-optic sensor array according to claim 1 [array 15 as shown in Figure 1 and discussed on page 6, lines 2-5 and elsewhere in the specification] and further including an interrogation system [interrogation unit 12 as shown in Figure 1 and discussed on page 7, lines 9-18 and elsewhere in the specification], said interrogation system, responsive to said sensed data output from said array indicative of a force applied to at least one of said sensors, for establishing a position at which said force is applied [data link 14 as shown in Figure 1 and discussed on page 6, lines 6-9 and elsewhere in the specification].

15. A method of establishing the position at which an object moving on a surface crosses a path of fixed length, wherein said method comprises the steps of:

(i) positioning a fibre-optic sensor array according to claim 1 [array 15 as shown in Figure 1 and discussed on page 6, lines 2-5 and elsewhere in the specification] adjacent said path; and

(ii) analysing [interrogation unit 12 as shown in Figure 1 and discussed on page 7, lines 9-18 and elsewhere in the specification] optical signals received from the sensor array [data link 14 as shown in Figure 1 and discussed on page 6, lines

6-9 and elsewhere in the specification] to establish the position of the object crossing the path.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-5, 8-10, 12, 15 and 16 stand rejected under 35 USC §102(b) in the Final Rejection as being anticipated by Yurek (U.S. Patent 5,140,154).

Note: While in the Final Rejection, Claims 1-7 stand rejected under 35 USC §102(a) as being anticipated by Goldner (U.S. Publication 2006/0120675) and Claims 11, 13 and 14 stand rejected under 35 USC §103(a) as being obvious over Goldner, these rejections have been "dropped" by the Examiner as noted in the Advisory Action mailed May 7, 2008.

VII. ARGUMENT

Appellants' arguments include the fact that the burden is on the Examiner to first and foremost properly construe the language of the claims to determine what structure and/or method steps are covered by that claim. After proper construction of the claim language, the burden is also on the Examiner to demonstrate where a single reference (in the case of anticipation) or a plurality of references (in the case of an obviousness rejection) teaches each of the structures and/or method steps recited in independent claim 1 and dependent claims 2 and 15.

The Court of Appeals for the Federal Circuit has noted in the case of *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick*, 221 USPQ 481, 485 (Fed. Cir. 1984) that "[a]nticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim."

A. The Examiner continues to misread and misrepresent Appellants' claim language

The Examiner alleges on page 2 of the Final Rejection that Applicants have failed to establish any definition of "fiber-optic point sensors" and "distributed fiber-optic point sensor" in the claim or the specification (emphasis added). The Examiner is completely correct as nowhere in Appellants' claim 1 does the phrase "distributed fiber-optic point sensor" appear and therefore there is no need for any definition of this term.

However, in the previously filed Amendment (filed 09/17/07), appellants submitted a photocopy of "Optical Fibre Sensor Technology" having a date of 1999 clearly establishing that "single point measurement" and "distributed measurement" are terms that are well known by those of ordinary skill in the art of optical fiber sensor technology (copy attached hereto in X. Evidence Appendix). The Amendment also points out that the terms "fibre-optic point sensor" and "distributed fibre-optic sensor" which are terms present in the appealed claims are clearly disclosed in Appellants' specification at page 6, lines 1-5

> ("In Figure 1, a fibre-optic perimeter surveillance system according to the invention is indicated generally by 10. The system 10 comprises a series of fibre-optic point sensors 16A, 16B, 16C, 16D, ..., 16N (in this example, geophones) optically linked by a series of distributed fibre-optic sensors 18B, 18C, 18D, ..., 18N to form a fibre-optic sensor array.").

The Examiner has misstated the language of Appellants' claims, ignored the knowledge of those having ordinary skill in this art and ignored the examples and definitions contained in Appellants' specification. These errors are believed reversible by the Board.

B. The Examiner continues to misunderstand the teaching of the Yurek patent

The Examiner again alleges that Yurek (the Examiner insists upon misspelling Yurek as Yurak in the Official Action) teaches "distributed fiber-optic sensor 10a" and that "the distributed fiber-optic sensor 10a is delivering and pass out optical signal [sic]" (first full paragraph on page 3 of the Final Rejection). The previous Amendment corrected the Examiner's misunderstanding by pointing out that Yurek teaches a plurality of point sensor units 30 "separated by a coil delay element 10a" (column 4, lines 12-20). Thus, the Examiner is aware that item 10a in Yurek cannot be a "distributed fibre-optic sensor" because it is clearly labelled a "coil delay element 10a."

The Examiner fails to read and understand the plain language of the words set forth in the Yurek reference. The Examiner provides no explanation as to how

or why she believes Yurek's disclosure of a coil delay element 10a can be construed to be a "distributed fibre-optic sensor" as required by Appellants' claims. Even though these facts were pointed out to the Examiner in the previously filed Amendment, nevertheless the Examiner has retained her misstatements and misapprehensions with respect to the Yurek reference in the Final Rejection. The burden is on the Examiner to establish where or how a prior art reference teaches Appellants' claimed structures, and the Examiner's failure to read the plain language of the Yurek reference is clearly reversible error.

C. The Examiner fails to provide any support for her position, even when formally requested

On page 8, second full paragraph of Appellants' September 17, 2007 Amendment, the Examiner was asked to identify where Yurek contained any disclosure which could be considered to be a "distributed fibre-optic sensor" as claimed in independent claim 1. The Examiner failed to respond to this request in the Final Rejection.

In the third full paragraph on page 8 of Appellants' Amendment, the Examiner was requested "to identify appropriate documentation establishing this mode of operation of the disclosed delay elements" in the Yurek reference, i.e., delay elements 10a. The Examiner failed to respond to this request as well.

However, the Examiner now alleges in the sentence bridging pages 2-3 of the Final, that the delay elements 10a somehow "inherently" show a distributed

fibre-optic sensor. The Examiner has never explained how or why she believes a "fibre-optic sensor" is inherently shown by a "coil delay element 10a." She is again requested to identify any teaching in Yurek which she believes supports her "inherency" contention.

The multiple failures to provide any evidentiary support for the Examiner's interpretation of the Yurek reference point to the plain fact that there is no disclosure, inherent or otherwise, and the continued rejection, without supports, is clearly reversible error.

D. The Examiner fails to apply current Federal Circuit and MPEP instructions as to the "effect of preamble"

In the last full paragraph on page 3 of the Final Rejection, the Examiner cites a more than 55-year-old CCPA case as support for her conclusion that the limitations in the preamble can be disregarded. The Examiner's attention is directed to the Manual of Patent Examining Procedure (MPEP) Section 2111.02 and its statement that "any terminology in the preamble that limits the structure of the claimed invention must be treated as a claim limitation" with the MPEP citing the appropriate *Corning Glass Works* decision of the Federal Circuit.

Even in deference to the Examiner's citation of he *Kropa* case, a review of Appellants' independent claim will establish that the preamble of the claim is necessary in order to give sense and meaning to the combination of the subsequently recited elements, i.e., the elements are combined in a "sensor array"

for a surveillance system. Thus, even if the *Kropa* reference is still "good law," consideration of the preamble under the circumstances of independent claim 1 is a requirement.

In independent claim 1, a "fibre-optic sensor array for a surveillance system" is disclosed, thereby clearly indicating that the subsequently recited structure must be combined in a "sensor array for a surveillance system." The Examiner has simply misstated the position of the MPEP and the Federal Circuit, and this misapplication of the law is reversible error.

E. The Examiner fails to establish where the Yurek reference anticipates the three claimed structures of independent claim 1 and therefore the anticipation rejection of claims 1-5, 8-10, 12, 15 and 16 fails

As noted above in *Lindemann*, the burden is on the Examiner to establish where the Yurek reference teaches each of three claimed structures in independent claim 1.

Claim 1 requires "at least two fibre-optic point sensors" and "a distributed fibre-optic sensor linking said at least two fibre-optic point sensors." While the Examiner dwells on ignoring claim limitations from the preamble as discussed in section D above and failing to properly construe the existing language of the claims as noted in sections A and C above and perhaps because of her misunderstanding of the Yurek reference as noted in section B above, the

Examiner spends no portion of the Final Rejection identifying where the specifically claimed elements are disclosed in the Yurek reference.

Because the Examiner cannot articulate where or how Yurek discloses a "distributed fibre-optic sensor" or one where it connects two point sensors, she cannot meet her burden of proof that all claim 1 elements are disclosed in the Yurek reference. The Examiner's clear failure to establish where each of the claimed elements and each of the claimed interrelationships is disclosed in the Yurek reference completely obviates any support for a rejection under 35 USC §102 and the continued rejection of independent claim 1 or claims dependent thereon is clear reversible error.

Moreover, Appellants also point out that dependent claim 2 specifies that the interrogation system is responsive to sensed data output. While the Examiner references Yurek at column 4, lines 34-55, she does not indicate how or why she believes there to be any disclosure of an interrogation system which is "responsive to said sensed data output from said array indicative of a force applied to at least one of said sensors" or that there is any interrelationship for "establishing a position at which said force is applied."

Similarly, with respect to claim 15 reciting a method of establishing "the position at which an object moving on a surface crosses a path of fixed length," the Examiner does not indicate how or where Yurek teaches any disclosure of these steps or the interrelationship between these steps. Because the Examiner can

find no teaching in the Yurek reference, she relies only upon the statement that "the claimed method steps are inherently shown by the Yurak [sic] et al reference." As noted above, when tested, the fallback position of "inherently shown" must be defended by the Examiner and in this instance, the Examiner has simply failed to provide any defense.

In view of the above, there is simply no basis for the anticipation rejection of independent claim 1 or claims dependent thereon. Moreover, when scrutinized, there is simply no support for the rejection of dependent claim 2 or dependent method claim 15 or any claims dependent thereon.

Accordingly, the Examiner's anticipation rejection under 35 USC §102 over the Yurek reference is simply without any support.

VIII. CONCLUSION

The Examiner has misconstrued the language of claim 1 and ignored both the conventional definition of the claim terms as well as the definition in the specification. She has misunderstood and misstated the "coil delay element 10a" in the Yurek reference which has nothing to do with a "distributed sensor." She has failed to respond to numerous inquiries as to where purported teaching exist in the Yurek reference. The Examiner has failed to follow the MPEP and apply modern Federal Circuit precedent and instead relies upon 55 year old CCPA case law. Because Yurek fails to teach either the claimed "distributed fibre-optic

sensor" or its claimed "linking" of the at least two "point sensors," there can be no anticipation of claim 1 or claims dependent thereon. Further, the Examiner fails to appreciate or disclose how or where the cited prior art discloses the features of claim 1 as limited by the further features of dependent claims 2 and 15 and each of these claims are believed independent of claim 1 to be clearly patentable over the prior art of record, as well as any claims dependent on claims 2 and 15.

As a result of the above, there is simply no support for the rejections of Appellants' independent claim or claims dependent thereon under 35 USC §102, and in view of the above, the sole remaining rejection of claims 1-5, 8-10, 12, 15 & 16 under 35 USC §§102 is clearly in error and reversal thereof by this Honorable Board is respectfully requested.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: _____

Stanley C. Spooner
Reg. No. 27,393

SCS:kmm
Enclosure

IX. CLAIMS APPENDIX

1. A fibre-optic sensor array for a surveillance system, the sensor array comprising:

at least two fibre-optic point sensors; and

a distributed fibre-optic sensor linking said at least two fibre-optic point sensors, wherein said sensor array provides an array output of sensed data from said at least two fibre-optic point sensors and said distributed fibre-optic sensor.

2. A fibre-optic surveillance system including a fibre-optic sensor array according to claim 1 and further including an interrogation system, said interrogation system, responsive to said sensed data output from said array indicative of a force applied to at least one of said sensors, for establishing a position at which said force is applied.

3. A fibre-optic surveillance system according to claim 2 wherein the fibre-optic sensor array is connected to the interrogation system by a fibre-optic cable.

4. A fibre-optic surveillance system according to claim 2 wherein the fibre-optic sensor array is connected to the interrogation system by a transducer and a wire cable.

5. A fibre-optic surveillance system according to claim 2 wherein each of the fibre-optic point sensors comprises optical fibre wound into a flexural disc.

6. A fibre-optic surveillance system according to claim 2 wherein the fibre-optic point sensors are geophones.

7. A fibre-optic surveillance system according to claim 2 wherein each fibre-optic point sensor comprises a fibre-optic accelerometer.

8. A fibre-optic surveillance system according to claim 2 wherein the distributed fibre-optic sensor comprises optical fibre packages within a cable to measure one of pressure on the cable and bend of the cable.

9. The system of claim 2 wherein the interrogation system comprises an interferometric interrogation system.

10. The system of claim 9 wherein the interferometric interrogation system comprises a reflectometric interferometric interrogation system.

11. The system of claim 10 wherein the reflectometric interferometric interrogation system comprises a pulsed reflectometric interferometric interrogation system.

12. The system of claim 11 wherein the pulsed reflectometric interferometric interrogation system employs time-division multiplexing to distinguish individual sensors.

13. The system of claim 2 wherein the interrogation system comprises a Rayleigh-backscatter interrogation system.

14. The system of claim 13 wherein the Rayleigh-backscatter interrogation system comprises a pulsed Rayleigh-backscatter interrogation system.

15. A method of establishing the position at which an object moving on a surface crosses a path of fixed length, wherein said method comprises the steps of:

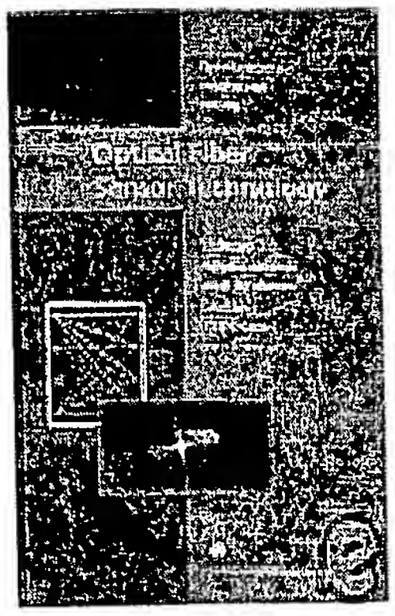
(i) positioning a fibre-optic sensor array according to claim 1 adjacent said path; and

(ii) analysing optical signals received from the sensor array to establish the position of the object crossing the path.

16. A method according to claim 15, wherein the optical signals are analysed by measuring the delay between signals received from adjacent said at least two fibre-optic point sensors along the array and combining these signals with a signal from the distributed fibre-optic array linking said at least two fibre-optic point sensors to locate and confirm said position.

X. EVIDENCE APPENDIX

Appellants submitted a photocopy of "Optical Fibre Sensor Technology" (by Grattan et. al. published 9/1/1999) in the Amendment filed 09/17/07 and this evidence is relied upon above (copy enclosed)



Optical Fibre Sensor Technology: Applications and Systems

Author(s): Grattan, K. T. V.; Meggitt, B. T.
ISBN10: 0412825708
ISBN13: 9780412825705
Format: Hardcover
Pub. Date: 9/1/1999
Publisher(s): Kluwer Academic Pub

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Synopsis

Recommended Titles

Optical Fiber Sensor Technology: Advanced Applications-Bragg Gratings and Distributed Sensors
Retail Price: ~~$240.00~~
Our Price: $234.06

Optical Fiber Sensor Technology: Fundamentals
Retail Price: ~~$237.00~~
Our Price: $222.78

Optical Fibre Sensor Technology: Chemical and Environmental Sensing
Retail Price: ~~$204.00~~
Our Price: $191.76

Optical Fiber Sensor Technology: Devices and Technology
Retail Price: ~~$223.00~~
Our Price: $209.62

No Image Available

Optical Fiber Sensor Technology
Retail Price: ~~$199.00~~
Our Price: $187.06

Synopsis

Concentrates on the applications of optical fiber sensor technology and systems that rely upon it with a particular emphasis on physical sensors.

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multi-mode and in particular in the relation to interferometric sensors, the temporal degree of coherence of the light in the sensor itself is important, as to whether it be high coherence, low coherence or even incoherent light, which will make a difference to the operation of the device. This distinction arises from the different optical sources used in the sensors themselves.

It is useful to consider the use of several different schematic representations to enable these distinctions to be seen more clearly. Following the pattern of Udd [6], a tree representing subdivisions of both extrinsic and intrinsic fiber optic sensors is shown in Figures 1.2 and 1.3, with Figure 1.4 reflecting the degree of diversity of the subdivision of interferometric fiber optic sensors. The devices considered are intrinsically totally passive sensors, i.e. those which do not require electric power at the sensor head, although a separate group of hybrid sensors exists including bulk, micro-optic or integrated optic elements where an additional power source is used, for example when local electrical powering is provided, often using transduction from optical radiation at the sensor head itself.

In order to be aware of and examine the diversity of the use of fiber optic sensors more fully, the wide range of measurements which can be addressed by fiber optic sensors can be seen, as is tabulated in Figure 1.5 from the work of Jackson [7] where the use of different types of fibers to measure a number of parameters is revealed. This is complemented by Figure 1.6 from the work of Spooncer [3] showing an illustration of the subcategories of one specific group, i.e. multi-mode OFSs in terms of intensity, wavelength or time modulation, as examples.

Further scope for classification of sensors exists using a basis of whether the sensor is making a **single point measurement** i.e. a specific measurement at a particular point in space, or offers the possibility of **distributed measurement**, such as can be achieved with the use of optical time domain reflectometry (OTDR)

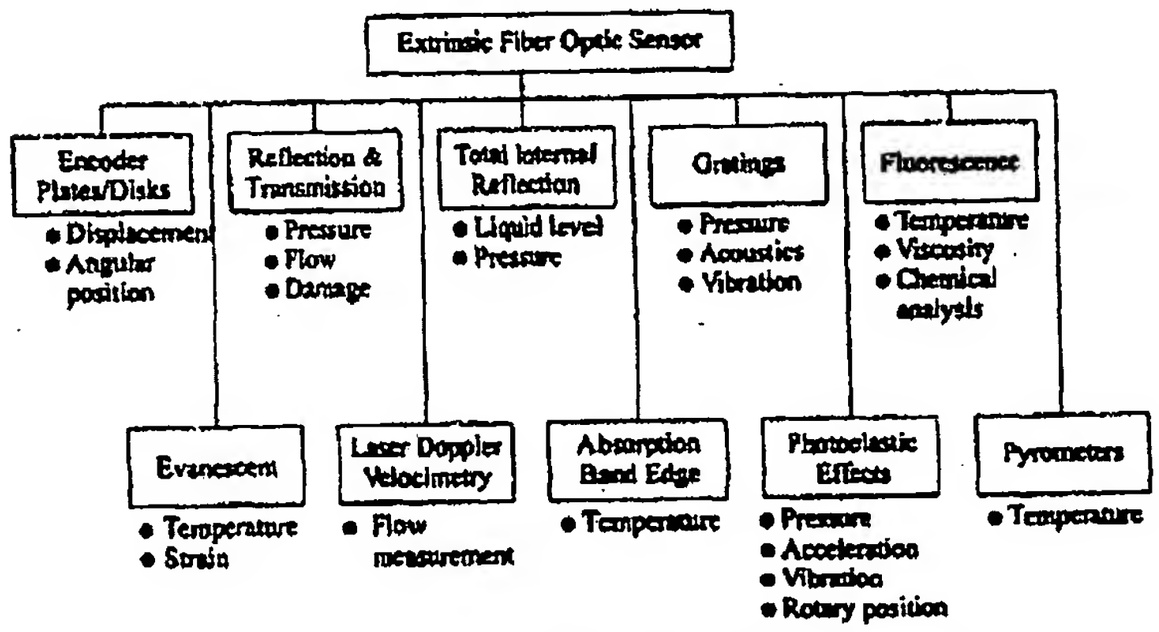

Fig. 1.2 Extrinsic fiber optic sensor applications (after Udd, 1991).

XI. RELATED PROCEEDINGS APPENDIX

None.